

## THE IDENTITY OF THE FROG *EUPSOPHUS* *VANZOLINII* FROM RAMADILLAS, NAHUELBUTA RANGE, SOUTHERN CHILE

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*Abstract.*—The frog *Eupsophus vanzolinii* is shown to be a species of the genus *Alsodes*. The species is redescribed on the basis of 38 fixed specimens, and natural history notes on the species are presented.

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Donoso-Barros (1974) described a new species of leptodactylid frog, *Eupsophus vanzolinii*, on the basis of specimens from Ramadillas (73°15'S, 37°15'W), at 100 m elevation on the western slope of the Nahuelbuta Range, Arauco Province, Chile. Little comment has been made concerning the systematic status of this species, although Lynch (1978) transferred *E. vanzolinii* to the genus *Alsodes* on the basis of specimens collected by W. E. Duellman in Cabrería (73°7'S, 50'W), Parque Nacional Nahuelbuta, 1,030 m elevation, Malleco Province, Chile. The air line distance between these points is 65 km.

I analyzed the frogs collected by Duellman in Cabrería, which Lynch (1978) considered *Alsodes vanzolinii*, and the specimens found by Donoso-Barros in Ramadillas, and concluded that the frogs of the two places are different species.

The frogs from Cabrería were previously identified as *Eupsophus coppingeri* (= *Alsodes monticola*) (Iturra and Veloso, 1975), and as *E. vanzolinii* (Duellman and Veloso, 1978). Grandison (1961) used the name *Eupsophus coppingeri* (= *Alsodes monticola*) for the following frogs from Cabrería: Chicago Natural History Museum 44210-44214, 44216-44219, Cabrería, 800 m, Nahuelbuta, Angol; 40136, Nahuelbuta, Angol. According to my colleague Alberto Veloso, the frogs of Cabrería are a new species which is now being described by him.

As a result of the study of the specimens collected by Donoso-Barros in Ramadillas I conclude that *Eupsophus vanzolinii* Donoso-Barros, 1974, must be transferred to the genus *Alsodes* because the males have spiny excrescences on the thumb and chest, the distal edge of the xiphisternum is notched, the nasal bones are large, the cultriform process is long and the anterior end extends between the palatines.

### Redescription of *Alsodes vanzolinii*

#### Fig. 1

*Diagnosis.*—*Alsodes vanzolinii* is a moderate sized species that can be distinguished from its congeners by the following combination of characters:



Fig. 1. Holotype of *Alsodes vanzolinii* (Donoso-Barros), MUZUC 12063, female.

1) rudiment of web between the fifth and fourth toes; 2) thinner limbs; 3) notched tongue covered by minute papillae; 4) yellow triangle on the head.

*Description (based on 38 fixed specimens).*—Head slightly wider than long. Snout rounded and sometimes truncate in lateral and dorsal profile; canthus rostralis well defined; loreal region flat, sloping abruptly to lip; lips not flared. Nostrils lateral, closer to tip of snout than to orbit; length of eye greater than the distance between eye and nostril; interorbital distance greater than internarial distance. Tympanum absent. Well developed glandular fold from behind eye to insertion of arm. Large cordiform tongue, notched behind, covered by minute transparent papillae, posterior one-third free. Relatively small, round choanae; dentigerous process of prevomers lying median to and slightly below choanae, separated medially, transverse or slightly oblique, each process bearing 4–6 teeth. Forelimbs thin; first finger equal in length to second; third finger much longer than fourth; digital length in decreasing order 3-4-2-1. Palmar webbing absent (Fig. 2a); tips of fingers slightly expanded. Large elliptical and prominent inner palmar tubercle; outer palmar tubercle ovoid and smaller than inner; subarticular tubercles moderate sized, conical, and simple; supernumerary palmar tubercles present. Hind limbs slender, tibiotarsal articulation reaching to middle of eye. Toes long (Fig. 2b), slender and fringed; third and fifth toes equal in length; toes in decreasing order of length 4-(3,5)-2-1. Outer metatarsal tubercle ovoid and flattened, inner metatarsal tubercle small and conical. Subartic-

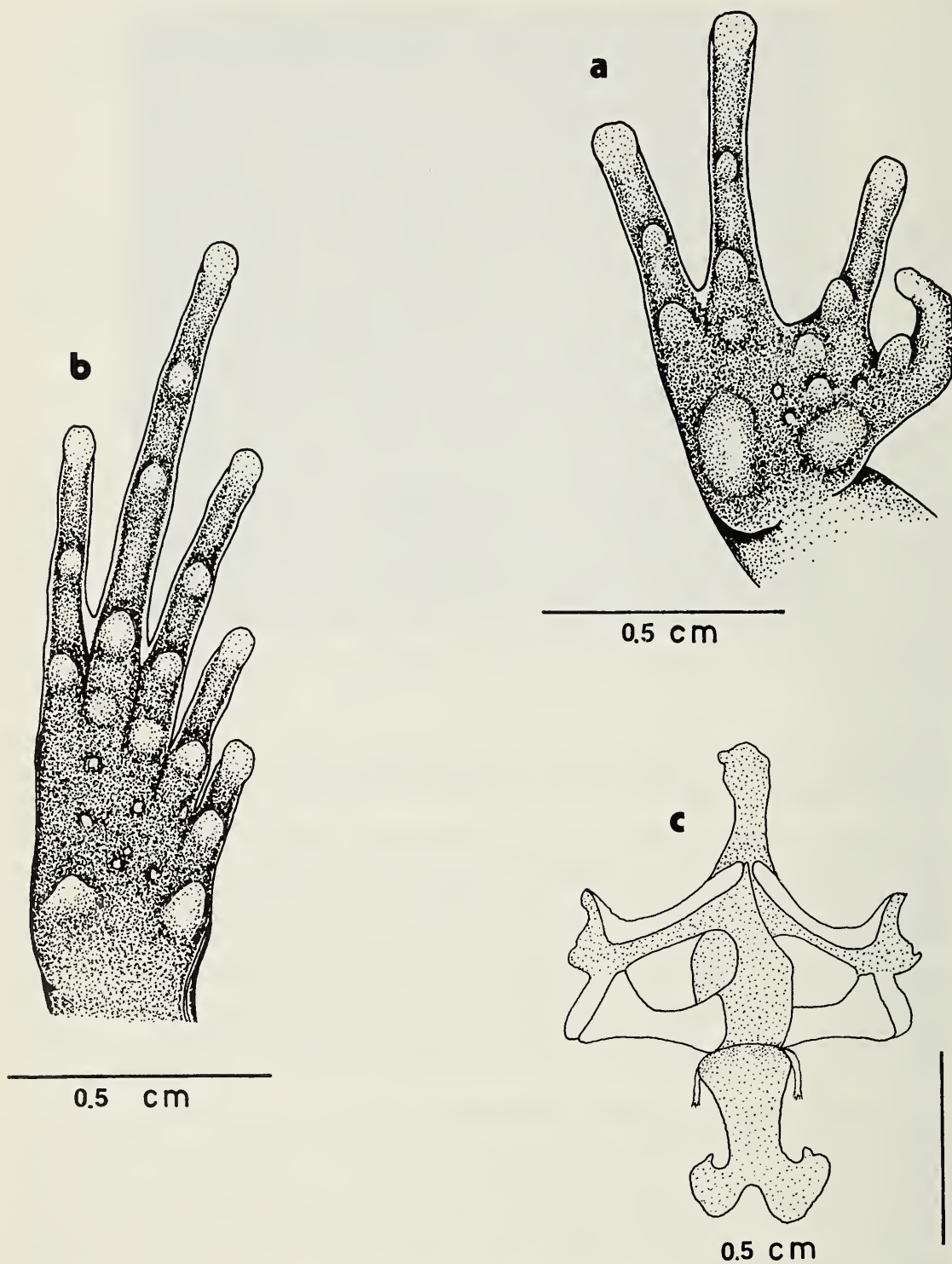


Fig. 2. Hand (a), foot (b), and pectoral girdle (c) of *Alsodes vanzolinii*.



Table 1.—Measurements (mm) and proportions of *Alsodes vanzolinii*.

Character	15 males		13 females	
	Range	$\bar{x} \pm SD$	Range	$\bar{x} \pm SD$
Snout-vent length (SVL)	36.4–52.2	46.2 $\pm$ 5.4	42.7–54.4	51.1 $\pm$ 3.8
Tibia length/SVL	.50–.59	.53 $\pm$ .02	.49–.55	.51 $\pm$ .01
Foot length/SVL	.48–.61	.54 $\pm$ .03	.50–.56	.53 $\pm$ .01
Head length/SVL	.35–.42	.38 $\pm$ .01	.33–.41	.36 $\pm$ .02
Head width/SVL	.38–.43	.40 $\pm$ .01	.37–.42	.39 $\pm$ .01
Interorbital distance/head width	.22–.28	.24 $\pm$ .02	.22–.28	.25 $\pm$ .04
Eye-nostril/head length	.22–.32	.26 $\pm$ .02	.24–.31	.27 $\pm$ .02

ular tubercles large and conical; minute supernumerary tubercles present. Tarsal fold present and reduced. Rudiment of web between fifth and fourth toes. Anal opening oriented transversely, at dorsal level of thighs, and inconspicuously ornamented.

Skin smooth, minute tubercles on flanks, dorsum and head; posteroventral areas of thighs with tuberculate skin. Dorsum brown with irregular whitish spots; head with a yellow triangle. Venter usually whitish, but some specimens show a dark background with minute irregular spots; juveniles have black mottled belly with irregular white spots. Throat whitish, loreal region dark. Dark brown glandular fold behind the eyes. Some specimens have a white vertebral line that reaches to the middle of the back. Arms, shanks, thighs and tarsi barred dark brown.

Variation in proportions is summarized in Table 1.

### Osteology

*Pectoral girdle*.—The pectoral girdle is arciferal (Fig. 2c). Clavicles arched and not in contact medially, tips extending anteriorly to a line between the anterior edges of the scapulae. Clavicles in contact with the *pars acromialis* but not overlying it. Scapula proximally bicapitate. Coracoids dilated at their distal and proximal ends and slightly wider than the clavicles. Epicoracoidal cartilages free. Procoracoids fused anteromedially and laterally to the clavicle. The large omosternum has no endochondral ossification and the manubrial portion is well defined. Sternum well developed; the proximal and medial regions show ossification. Metasternum and xiphisternum well differentiated. Distal edge of xiphisternum notched.

*Cranial osteology*.—The nasal bones are large but not in median contact and are separated from the frontoparietals (Fig. 3a). Nasals have long maxillary processes which do not contact the maxillae; margins of nasals rest on the anterolateral margin of the sphenethmoid. Frontoparietal fontanelle narrow at posterior end and wide at anterior part. Anteriorly, the fronto-

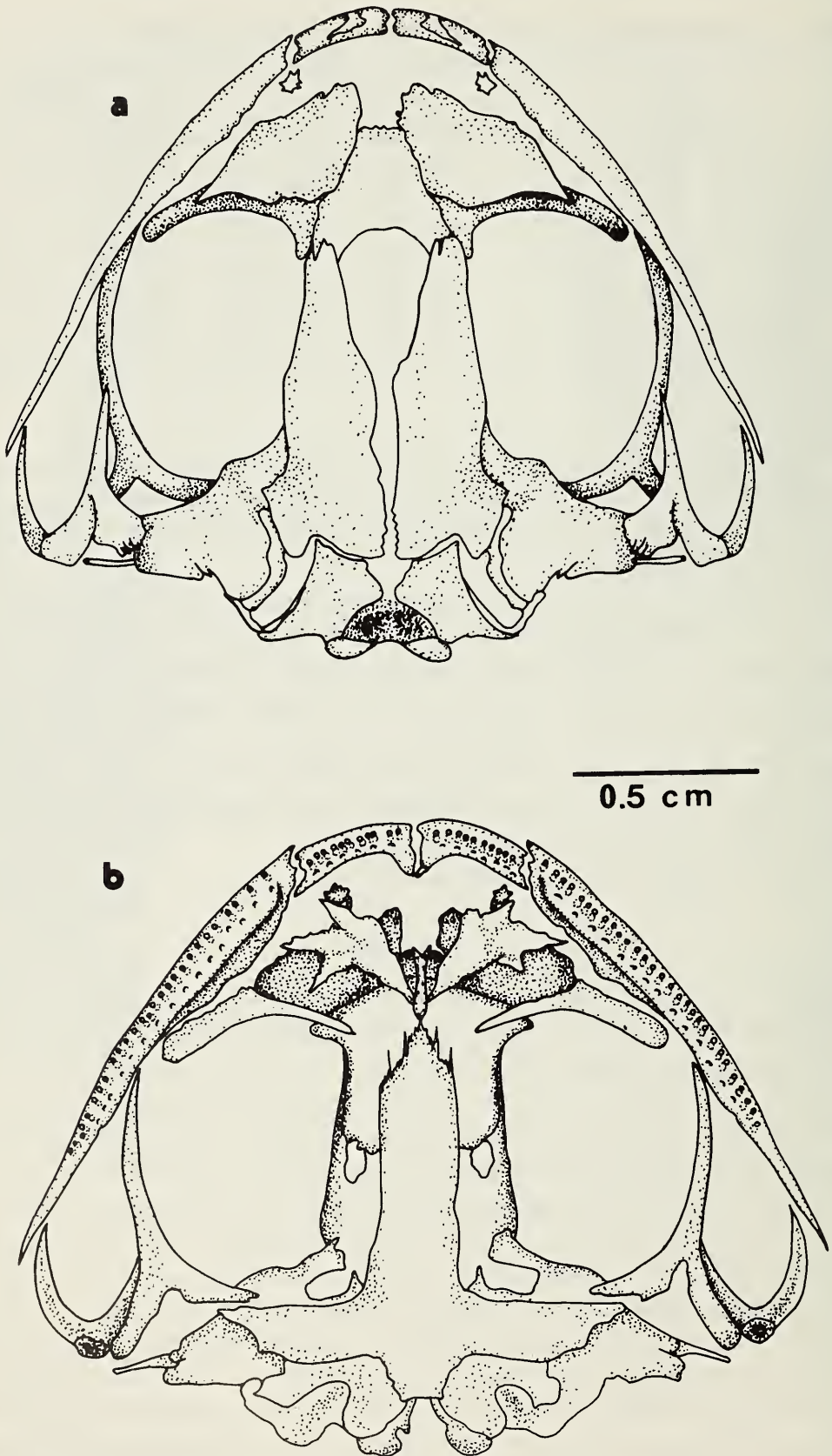


Fig. 3. Skull of *Alsodes vanzolinii*: dorsal (a) and ventral (b) view.

parietals broadly rest on the posterolateral margin of the sphenethmoid; posteriorly they rest on the otoccipitals. Maxillary arch complete. Premaxillae narrow, the alary processes of moderate length and directed dorsally. The 14–15 premaxillary teeth moderately long; *pars palatina* narrow, but the palatine process moderate sized. *Pars facialis* of the maxilla relatively deep and restricted to the snout. Maxilla bears 42–44 teeth in a row extending to a point just posterior to the maxillo-pterygoid junction. Quadratojugal of moderate size and broadly articulating with the maxilla. Otoccipital poorly ossified with low epiotic eminences. Occipital condyles (Fig. 3b) not stalked and narrowly separated. Columela present. Zygomatic ramus of squamosal of moderate length; otic ramus short, broad at distal end, and not in contact with the *crista parotica*. Parasphenoid cruciform. Cultriform process long, gradually narrowing anteriorly, the anterior end extending slightly between the palatines. Parasphenoid alae oriented at right angle to the cultriform process. Anterior ramus of pterygoid rests on the palatal shelf of the maxilla, but does not reach the palatines. Palatines broad and arched, extending from the maxillae to the sphenethmoid. Prevomeres small and broadly separated.

### Natural History

Donoso-Barros (1974) considered the holotype of *Alsodes vanzolinii* a male; however, my examination shows that this specimen (MUZUC 12063, Donoso-Barros's field number 4938) has yellow ovarian eggs. All the females examined that have been collected during January and February have moderate sized eggs ( $\bar{x} = 2.33 \pm 0.15$  mm diameter); 134 immature ovarian eggs were counted in one female (MUZUC 12216). Adult males found during these months have nuptial spines on the chest and on the dorsal surface of the thumb and second finger.

The type locality (Ramadillas) is highly disturbed by human intervention, there being only small patches of the primitive *Nothofagus* forest. In this place we also collected *Bufo rubropunctatus*, *Rhinoderma darwinii*, and *Telmatobufo venustus*.

### Comparisons

*Alsodes vanzolinii* shows a rudiment of web between the fifth and fourth toes. This characteristic is also present in *Alsodes nodosus* (Cei, 1962) and *A. monticola* (Formas, personal observation). Webbing is absent in *A. il-lotus* (Gallardo, 1962). *Alsodes gargola* (Gallardo, 1970), *A. laevis* and *A. montanus* (Cei, 1962) share well developed interdigital webbing. *Alsodes vanzolinii* and *A. nodosus* have minute transparent papillae on the tongue, but this character is absent in *A. monticola*; the tongue of the latter species does not have papillae anteriorly.



*Alsodes nodosus* has 65.8 mm snout-vent length (25 adults) differing in this respect from *A. vanzolinii* (54.4 mm, 28 adults). On the other hand, *Alsodes nodosus* have robust limbs, which are slender in *A. vanzolinii*. Finally, *A. vanzolinii* has a yellow triangle on the snout, which is absent in *Alsodes nodosus*.

### Specimens Examined

*Abbreviations.*—University of Kansas Museum of Natural History (KU), Museo de Zoología, Universidad de Concepción (MUZUC), Instituto de Zoología, Universidad Austral de Chile (IZUA).

*Alsodes montanus*: IZUA 823–24; Estero Covarrubias, Provincia Santiago, 2,400 m.

*Alsodes monticola*: IZUA 1149–1154; Cordillera Pelada, Provincia Valdivia, 1,020 m.

*Alsodes nodosus*: IZUA 747–761, 767–776; Aguas Claras, Provincia Aconcagua, 150 m.

*Alsodes vanzolinii*: MUZUC 12063–70, 12209–18, 12221, 12223–25, 12227–28, 12231–44; Ramadillas, Provincia Arauco, 100 m.

*Alsodes* sp.: KU 162206–09, 162212, 162221–22, 162229, 162232; Cabrerías, Parque Nacional Nahuelbuta, 1,030 m.

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